

**ROCKY MOUNTAIN CENTER FOR
OCCUPATIONAL AND
ENVIRONMENTAL HEALTH -
EDUCATION AND RESEARCH CENTER
FOR OCCUPATIONAL SAFETY AND
HEALTH**

SUMMARY ANNUAL REPORT

July 1, 2011-June 30, 2012

**NIOSH Training Grant
No. T42 OH 008414**

**SUBMITTED BY:
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Section I

ERC Summary

The RMCOEH is a vibrant, innovative and growing ERC that has been in existence at the U. of Utah since 1977. It is one of only two ERCs in Region VIII (UT, CO, WY, MT, ND, SD), although these states are in the top rankings for occupational fatalities and thus have an urgent need for more OSH professionals. In the past grant period, we have made major progress, including ground-breaking legislation supporting the RMCOEH. We have 2 new endowed chairs (OSH and mining). Our programs are growing and quality of graduates has accelerated. We have initiated 3 new graduate degrees (MOH, MSOH, PhD in OEH). The RMCOEH has academic programs in OMR, IH, E&S and OIPRT and has over 150 full time, adjunct and other supporting faculty. We provide specific curricula by OHNs to teach the importance of OHN to our trainees. Our CE Programs train >2,500 trainees/year and outreach includes 1,100+ businesses.

The RMCOEH enjoys unparalleled collaborative relationships with businesses, employee groups, governmental units, and other community organizations. These foster an atmosphere that facilitates state-of-the art training for OSH professionals for the 21st Century. These relationships also provide the external 'laboratories' to test research theories and develop the innovations to provide safer and healthier workplaces. We also have a highly active RMCOEH Advisory Board and a Center Executive Committee that are critical in advancing the RMCOEH's programs. The RMCOEH has the infrastructure to support the NORA II, r2p and other research missions. The RMCOEH's CE and Outreach programs promote and publicize efficacious strategies and help ensure that knowledge is translated into practice.

Relevance

The RMCOEH is among the largest graduate OSH training programs in the US. It serves HHS Region 8 which has among the highest occupational death and injury rates. The RMCOEH's NORA research programs address major deficits in the region/nation's OSH. Research foci particularly include: musculoskeletal disorders, respiratory protection, transportation safety, and mining issues.

Key Personnel

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ERC web link

<http://medicine.utah.edu/rmcoeh/>

Section II

Administration Kurt T. Hegmann, MD, MPH, Center Director

In 2011-12, the RMCOEH continued to meet all goals and objectives. The RMCOEH holds monthly Center Executive Committee meetings, biannual RMCOEH Advisory Board meetings, Advisory Board Executive Committee meetings and an annual RMCOEH retreat. There were several major advances.

- The RMCOEH has matriculated and graduated its fourth class of students in our new, accredited Master of Occupational Health and Master of Science in Occupational Health Degree Programs.
- The center continued implementation of our plan to increase student publications, with demonstrable major successes in 2011.
- The RMCOEH received approval for a new Ph.D. in Occupational & Environmental Health, with 3 emphases (Industrial Hygiene, Occupational Injury Prevention and a General emphasis).
- RMCOEH received notification of funding of another new K01 award and an R01.

Diversity Recruitment Darrah Sleeth, PhD

RMCOEH faculty members continue to work with Sweeney Windchief, Assistant Dean for Diversity at the University of Utah to maintain and increase recruitment from under-represented groups. For example, under-represented individuals who expressed an interest in related graduate programs have been identified through the GRE Search Service and personalized contact has been made. In addition, increased contact, including providing program brochures, has been initiated with those involved with diversity at other universities in Region 8, including several Native American Tribal Colleges, as well as with various community and student organizations.

Statistical Economic Evaluation Unit (SEEU) Maureen Murtaugh, PhD The SEEU served as a resource to the Center in providing the statistical and economic tools for evaluating interventions to improve workplace health and safety. The SEEU continues to contribute through providing insights, including participation in journal club meetings, consultation regarding analysis approach for publications, and participation in grant preparation. A graduate student survey results have been analyzed and utilized in planning to keep all of our educational programs exceptional.

Outreach Connie Crandall, MA, MBA

Outreach continued to be a significant emphasis at the RMCOEH, maintaining the goal of ensuring that knowledge is translated into practice. The Center policy requires measurable outreach activities by each faculty member with thousands of contact hours recorded annually. We logged contact hours in activities that included appointments, presentations, consultations, and participation in career day events for national, regional and academic institutions, local business and trade, insurers, community groups, occupational and environmental health organizations, and the public. The program is further exploring social media and is continuing to develop discussions relative to creating a useful blog for dissemination of newsletters, research results, and papers.

Pilot/Small Projects Research Training (PPRT) Maureen Murtaugh, RD, PhD

The review process was slightly changed to align with NIH review including use of the NIH review template for R03 projects. Five of nine projects submitted for the 2011-2012 cycle were funded. Progress has been made in all projects and three are complete. Two projects from Mechanical Engineering at the University of Utah are complete. "Quantifying shoulder stress during pushing and pulling tasks" was designed to assess participants performing pushing and pulling tasks in a laboratory setting. Two manuscripts have been submitted and the project is complete. "Assembly Force Requirements and Human Capabilities for Upstream Design Planning" is complete and a manuscript is in preparation. A project titled "Comparing Clustering and Metaheuristic Algorithms for Designing Warning Symbols", Adam Piper, South Dakota School of Mines and Technology was completed. The investigators are now proposing a two-phase plan to test the system's ability to converge upon a safety symbol design that is of high quality. Two other projects have been granted an extension, but are actively pursuing their aims. Dr. Darrah Sleeth received funding for "Development of an Aerosol Research Laboratory for Exposure Simulation Studies". Her progress was limited by a location for the wind tunnel. Ms.

Ulrike Ott is in the final stages of her project to assess the "Relationship of Cholesterol Levels and Knowledge among an Industrial Population" to complete her PhD.

The Pilot/Small Projects Research Training Management Committee met on 29 June 2012 to determine the 2012-13 awardees. Five awards were made and awardees were notified the first week of June. Members were pleased with grading process, funding levels, and the number and quality of applications.

NORA Research Project Kurt T. Hegmann, MD, MPH

The LBP cohort study continued. We did not enroll more subjects in the past year. Instead we terminated followup of the subjects through termination examinations conducted in March-May 2012. We have continued work on data clean-up with the approx. 120M datapoints. Final statistical analyses have begun and manuscripts are being drafted.

Ergonomics & Safety (E&S) Don Boswick, PhD, PE, CPE

The E&S Program trained 21 full time (12 M.S., 9 Ph.D.) and 3 part time trainees (1 M.S., 1 Ph.D., 1 ME) of whom 9 graduated during the AY (2 PhD, 6 M.S., 1 M.E.). The academic program now consists of eight 3-credit courses offered on a regular basis. All topics (both "highly recommended" and "recommended") noted in the NIOSH Guidelines for Graduate Programs in Occupational Safety (by The Occupational Safety Academic Training Program Panel) are covered in the M.S. and Ph.D. program courses (or pre-requisites). E&S students are required to present their research at the successful, annual Regional National Occupational Research Agenda (NORA) Young/New Investigators Symposium, which has been held on the University of Utah campus since 2003. The interdisciplinary course "Occupational Health Solutions" has been refined even further and is a great success. The course is team taught by Drs. Wood, Merryweather, and Larson (OM, E&S, and IH cores). This course includes on-site student projects completed by interdisciplinary teams from RMCOEH (IH/HSAT, OM, OIPRT, and E&S) who visit local manufacturing facilities and work together to solve real world health and safety problems. It is a required capstone course for all trainees. The off-site ATK M.S. Mechanical Engineering Program includes approximately 10 active students, of whom approximately 30% focus on Ergonomics and Safety as their area of emphasis and take 3-5 E&S courses. Dr. Boswick developed the approved graduate Systems Engineering Certificate in AY 2008/9 which continues. One area of emphasis is ergonomics and safety. Fifteen students have completed the certificate and there are approximately eight active students in the program.

Industrial Hygiene (IH) Rod Larson, PhD, CIH

This last funding period the IH program exceeded its goals and objectives. Six students graduated from the IH program this period Master of Science in Occupational Health (MSOH) degrees having emphasis in industrial hygiene. Eleven (11) full-time IH students began matriculation as new students in the MSOH degree program this same period; 6 in Fall 2011, 5 in Spring 2012 Semesters. Returning students include two full-time students, that will be part-time students this Fall semester, and one returning part-time student in the MSOH degree program; all three of these returning students had emphasis in the HSAT Program but because of the loss of the HSAT program funding, these three students are now IH students, but able to take a track in IH-Hazardous Substance. In addition, because of diversity recruiting, one of our current IH students is a black (African American) student. Thus, not including the 6 IH students that graduated, this brings the total number of IH students for this last year to fourteen. When the students that graduated are included; four full-time and two part-time students, the number of students in the general IH program was 20. This number does not include HSAT students that graduated this last year (see HSAT Program information below). The IH Program research projects included for example, working with OSHA scientists to evaluate and validate a new fiber collection method to determine concentrations of select organics in a solution based on head-space sampling, and an evaluation of the effectiveness of TiO2 treated air filters for removal of biological and chemical (e.g., VOCs) from air. We are currently accredited by ABET-ASAC and receive our site visit by an accreditation evaluation team in September, 2010. On August 2, 2011 we received official notice of renewal of our accreditation to September 30, 2017.

Hazardous Substances Academic Training (HSAT) Leon Pahler, PhD, MPH, CAIH

The HSAT program continued to meet its goals and objectives. One student graduated from this program in December, 2011 and six students graduated in May, 2012, all with MSOH degrees and emphasis in HSAT. This brings the total number of HSAT students to seven (7) for this period by including the student that graduated. However, as of July 1, 2012, the funding was lost for the HSAT Program and the program has now ceased to exist. Therefore, there are no new HSAT students, and those students that were in the HSAT Program but not yet graduated are now moved to the IH Program, but have the opportunity to study in a Hazardous Substance track within the IH Program As mentioned in the IH program summary, the Master of Science in Occupational Health (MSOH) degree was granted to HSAT as well as the general IH programs, and therefore, both were accredited by ABET-ASAC to September, 2017. With the loss of funding for the HSAT Program, students previously in the HSAT Program are now considered as IH students, but can still take a hazardous substance track within that that program. The HSAT students were involved in multiple research projects this last year, including evaluation of the new DustTrack DRX aerosol monitoring device for detection of total and respirable concentrations of silicon dioxide in air within an operating mining facility by correlation of monitoring results with the pump-filter methods, evaluations of potential exposures to arsenic used in a metal plating/finishing operation.. These evaluations involved testing of a GRIMM portable aerosol spectrometer to monitor for select metals, DustTrack model direct-read aerosol monitor, and a TRI Dust Pak monitoring unit.

Occupational Injury Prevention & Research Training (OIPRT) Don Bloswick, PhD, PE, CPE

The OIPRT program continued to meet its goals and objectives. The program trained four PhD level trainees during the AY (3 full-time, 1 part-time). The two primary goals from the last grant submission, (1) provide quality Occupational Safety Engineering (OSE) and Occupational Injury Epidemiology (OIE) academic programs, and (2) accomplish NORA-related OSE and OIE research and translate it into practice (r2p) have been accomplished. The academic program integrates engineering and epidemiology, with students in the OSE program emphasizing engineering and students in the OIE program emphasizing epidemiology. Three of the four OIP Students were involved in two large prospective NIOSH-funded research projects: Upper Limb Musculoskeletal Disorders - Quantifying Risk and/or Low Back Pain - Quantifying Risk Factors. One first-year Ph.D. OIPRT student has extensive academic and practical experience in construction safety. His Ph.D. research will likely relate to this area. In addition to journal submissions, students are required to present their research at the annual Regional National Occupational Research Agenda (NORA) Young/New Investigators Symposium, which has been held on the University of Utah campus since 2003.

Occupational Medicine (OM) Eric Wood, MD, MPH

In total, the OM residency program has trained 86 highly skilled OM physicians filling a critical need to NIOSH Region 8, which is underserved by OM specialists. During the period of 07/01/11-06/30/12, 10 residents were enrolled in the program with 4 residents in the academic PGY-2 year, and 6 residents in the practicum PGY-3 year (2 off-cycle resident transitioned from PGY-2 to PGY-3 year during the 2011-2012 period and are included as PGY-3). Current academic training consists of completion of graduate education over a period of 2 semesters leading to the MOH degree. Two PGY-2 OM residents completed the MOH degree in May 2012. Two residents from the US Air Force completed the MOH degree in May 2012 and are now PGY-3 Residents in Aerospace Medicine (RAM) with the US Air Force. We anticipate maintaining or increasing the number of residents through the US Air Force. We also plan to maintain the increased number of residents in the 2012-2013 academic year due to a grant awarded by the US Health Resources and Services Administration (HRSA). Clinical and research activities continue as in the past year. The program is developing updates to clinical practice guidelines for the American College of Occupational and Environmental Medicine (ACOEM) to improve care of injured workers.

Continuing Education (CE) Connie Crandall, MA, MBA

The CE Program met its goals and objectives for 2011-2012. Attendance remained high with 3085 trainees attending 202 CE activities. This includes both traditional (2968 trainees) and online (117 trainees) activities. The program continues to offer distance education courses that include online OSHA courses that are offered in cooperation with a commercial provider. It also continues to successfully offer the online Ethics and

Professional Practice of Industrial Hygiene course. Modules from an Occupational Epidemiology online academic course are being developed as continuing education offerings. Over this past grant period, we have sponsored courses in CO, ID, MT, NM, ND and WY. Numerous courses are also held outside of Salt Lake City (Clearfield, Dugway, Moab, Murray, Orem, Park City, Provo, Tremonton, and Woods Cross) to attract attendees from surrounding states. Courses are also held annually in Eastern Idaho to accommodate the needs of those requiring asbestos training in that area (although not Region 8, it is geographically proximate). Commercial Driver Medical Examination courses are held throughout the US. The program, again, collaborated with the MAP ERC in Colorado to sponsor the Rocky Mountain Academy of Occupational Medicine conference in Denver on February 3 & 4, 2012. New courses offered during this period include 1) NIOSH-Approved Spirometry Refresher; 2) Understanding Risk: Identification and Control; 3) Nanotechnology, 4) Crane Safety, 5) Best Practices in Hearing Conservation and Exposure Assessment, 5) Human Vibration Exposure; and 6) Managing Change in Safety and Health Programs. A collaborative regional needs assessment with the Colorado MAP and University of Minnesota ERC was conducted in June 2012.

Hazardous Substance Training (HST) Connie Crandall, MA, MBA

The HST Program met its identified goals and objectives for 2011-2012. 187 trainees attended 18 HST courses. The target audience for the training included government agencies as well as other facilities and organizations with a projected need for hazardous substances training. Several of these government agencies were represented on the HST Advisory Committee. Courses conducted in 2011-2012 include: 1) Chemical Reactivity Hazards; 2) Nine offerings of the 8-Hour Hazardous Waste Refresher; 3) Two 40-Hour Hazardous Waste Site Worker courses; 4) DOT Training for shippers of RCRA-Regulated Waste; and 5) 49CFR/IATA 4-Day Initial HAZMAT Training. Hazardous substances online courses are provided in partnership with the American Safety Council. A regional needs assessment was slated for 2012 but not conducted due to funding cuts.